DOOSAN

Optimal Solutions for the Future

BM series

Double Column Machining Center

BM series

BM 1530M
BM 2035M
BM 2740M

ver. EN 151218 SU

BM series

The BM Sereis is a large double-column type machining center designed to process molds. Equipped with a low-vibration built-in spindle, the machining center is suitable for a variety of works from roughing to finishing. The new improved design delivers greater efficiency, thereby raising customers' productivity and creating maximum added value.

Contents

Sample work


Press mold


Injection mold


Refrigerator mold


Automotive mold

Equipped with a high-speed, high-rigidity spindle as a standard feature

- 12000 r/min high-speed spindle
- Long-nose type ideal for deep pocket mold cutting
- Equipped with a dual contact spindle as a standard feature for high rigidity and minimum vibration

Standard feed axes equipment for higher level of precision

- All axes provided with a linear scale as a standard feature
- Ball screw bearings and nut cooling system

Adoption of structure and control solution for high-quality mold cutting

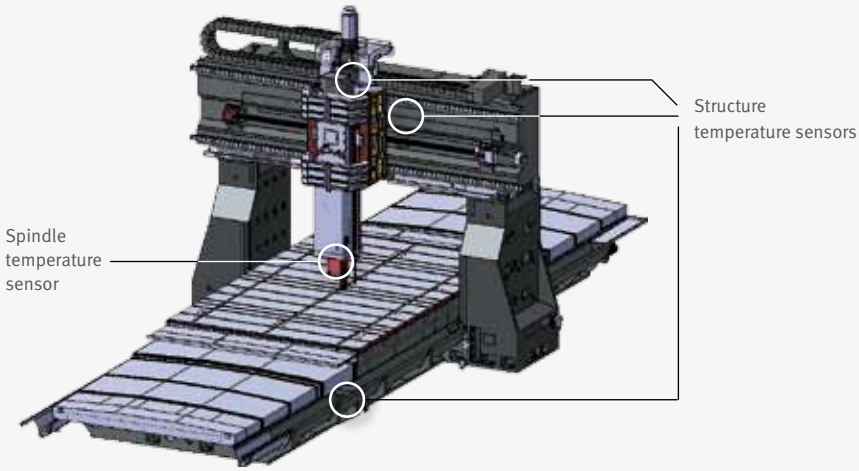
- Covers provided to minimize the impact of ambient temperature
- Thermal displacement compensation for spindle and structure included as a standard feature

Basic Structure

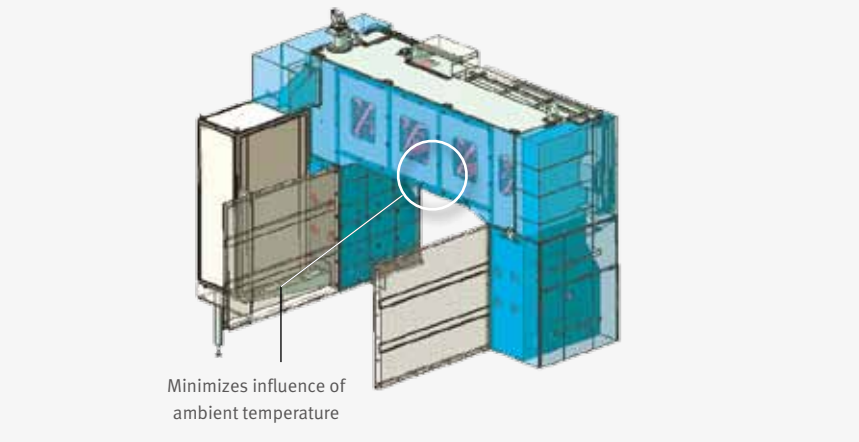
Double-column structure for stable precision level

Thermal Displacement Compensation for Spindle and Structure Included as a Standard Feature

Multiple thermal sensors are attached to minimize and compensate thermal displacement of the spindle and the structure.



Important parts of the structure are covered to minimize the impact of ambient temperature

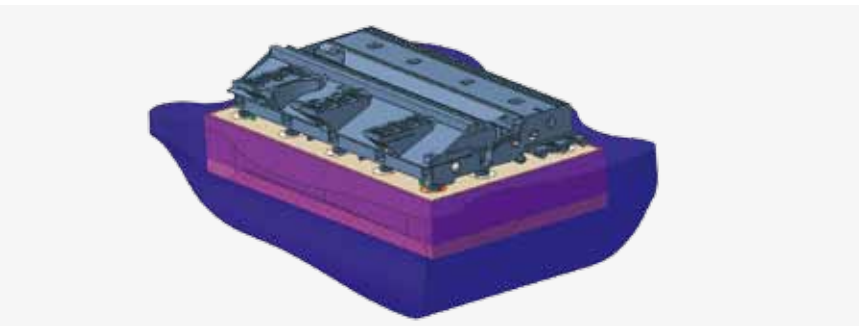


Foundation

Anchoring is recommended to ensure machining accuracy over a long time.

Machine Foundation*

Since machining accuracy is highly dependent on the machine's foundation, anchoring is recommended to maintain accuracy over a long period of time. The anchor bolts and other related parts for foundation work are supplied as standard items.



* Please consult with Doosan sales technicians regarding ground and operating conditions.

Spindle

A high-speed, high-rigidity built-in spindle is provided as a standard feature to enhance the productivity of machining large works as well as smaller parts.

Built-in Spindle Optimized for Cutting Molds

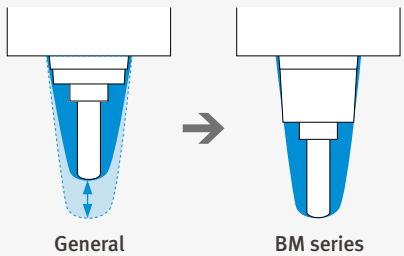
- Vibration and noise minimized with built-in spindle
- Long-nose spindle protrudes by 293 mm (11.5 inch), making it ideal for cutting deep pocket molds
- Dual contact spindle included as a standard feature for high rigidity and vibration

Advantaged with Deep pocket cutting

Long nose

293mm

(11.5 inch)



Max. spindle speed

12000r/min

Spindle motor

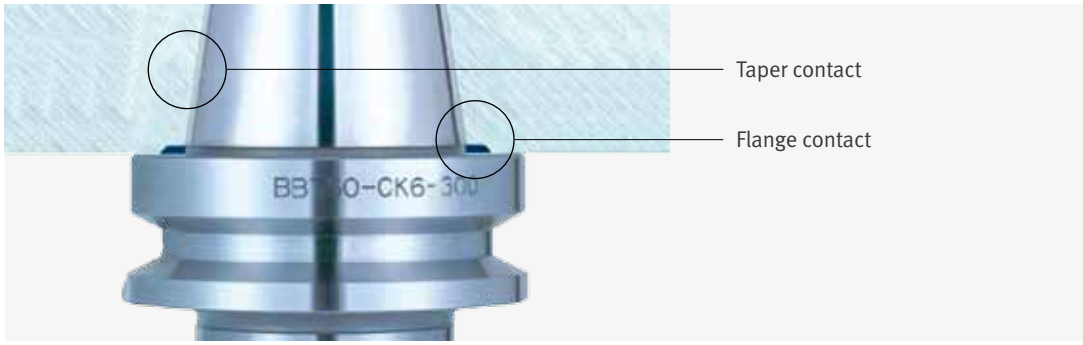
30 / 25kW

(40.2 / 33.5 Hp)

Type	Speed	Spindle	Specifications
Built-in ISO #50	12000 r/min	Power (30 min/cont.)	30 / 25 kW (40.2 / 33.5 Hp)
		Max. torque	420 N·m (310.0 ft-lbs)

Dual Contact Spindle

Tool rigidity is enhanced by the firm clamping of the spindle. Tool lifecycle and cut-surface roughness have been improved as a result of the reduced vibration realized by the dual contact spindle.



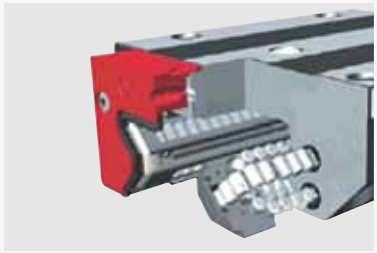
Feed Axes

Equipped with roller LM Guideways for increased rigidity and a cooling system as a standard feature to minimize thermal displacement.

Stable and Fast Feed Shaft Structure

Roller-type LM Guideways deliver high rigidity to guarantee the outstanding accuracy of the linear feed system.

High-rigidity feed system structure

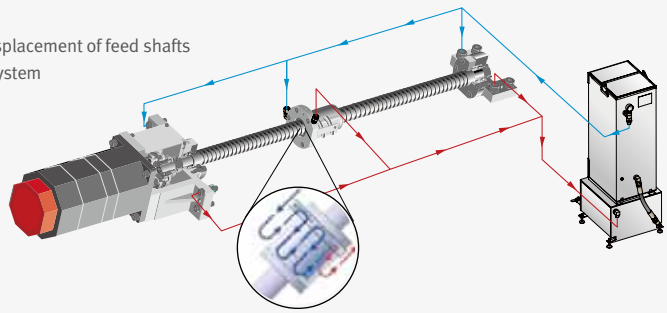


Roller guides

Rigid coupling

Ball screw nut cooling

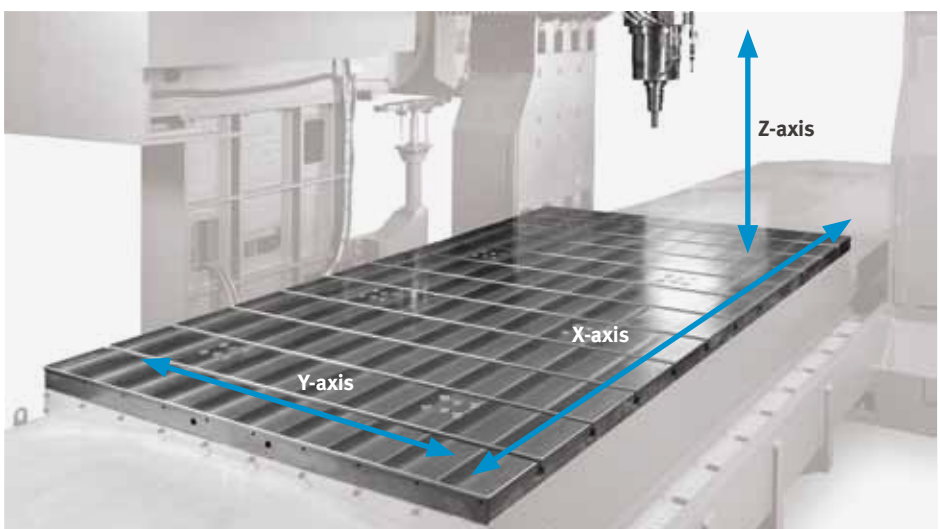
Greatly reduced thermal displacement of feed shafts
Stable rigidity of the feed system



Linear scale – standard for all axes

All axes are equipped with the linear scale as a standard feature to maintain the highest degree of accuracy over many hours of operation.

Additional 200mm (7.9 inch) Y-axis for table self-cutting & extended cutting area.

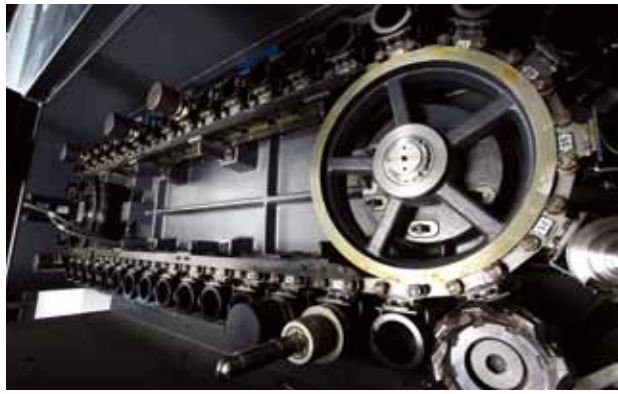


Description	Unit	BM 1530M	BM 2035M	BM2740M
Stroke (X / Y / Z)	mm (inch)	3000 / 1550 / 800 (118.1 / 61.0 / 31.5)	3500 / 2050 / 800 (137.8 / 80.7 / 31.5)	4000 / 2700 / 800 (157.5 / 106.3 / 31.5)
Rapid traverse (X / Y / Z)	m/min (ipm)	16 / 16 / 16 (629.9 / 629.9 / 629.9)	16 / 16 / 16 (629.9 / 629.9 / 629.9)	12 / 16 / 16 (472.4 / 629.9 / 629.9)

Magazine and Table

Tool Magazine

Enhanced productivity realized with the CAM-type tool changer (standard) for quicker tool changing



Description	Unit	BM Series
Tool storage capacity	ea	40 {60}
Tool-to-Tool	sec	3.0
Max. tool diameter	mm (inch)	125 / 220 (4.9 / 8.7)
Max. tool length	mm (inch)	400 (15.7)
Max. tool weight	kgf (lbs)	18 (8.8)

The table is fitted with 2 or 3 lanes of roller-type LM Guideways for highest machining stability.

Description	Unit	BM1530M	BM 2035M	BM 2740M
Size (X x Y)	mm (inch)	3000 x 1350 (118.1 x 53.1)	3500 x 1850 (137.8 x 72.8)	4000 x 2500 (157.5 x 98.4)
Load capacity	kgf (lbs)	8000 (17637.0)	10000 (22046.2)	15000 (33069.3)

Cutting Performance

Machining Performance

Enhanced productivity realized with the CAM-type tool changer (standard) for quicker tool changing.

Cutting Process	Tool mm (inch)	Spindle Speed r/min	Feedrate mm/min (ipm)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Cutting capability cm^3/min (inch)
FACEMILL (SM45C)	D125 (D4.9)	500	2900 (114.2)	100 (3.9)	3.0 (0.1)	820 (50.0)
		500	1800 (70.9)	100 (3.9)	4.0 (0.2)	720 (43.9)
		500	1300 (51.2)	100 (3.9)	5.0 (0.2)	650 (39.7)
		500	1100 (43.3)	100 (3.9)	6.0 (0.2)	660 (40.3)
		400	720 (28.3)	100 (3.9)	7.0 (0.3)	504 (30.8)

Cutting Process	Tool mm (inch)	Cutting Width mm (inch)	Cutting Depth mm (inch)	Cutting capability cm^3/min (inch)
U-DRILL	D80 (D3.1)	500 (2.9)	100 (3.9)	40 (2.4)
		600 (23.6)	100 (3.9)	40 (2.4)
TAP	M42 x 4.5	113 (4.4)	508 (20.0)	50 (3.1)

* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.

Standard / Optional Specifications

Various options are available to satisfy the customers' requirements.

● Standard ○ Optional

NO.	Description	Features	BM Series
1	Spindle	12000 r/min, 30 / 25 kW (30min / Cont.)	●
2		FLOOD COOLANT PUMP_0.9 kW_0.45 MPA	●
3		FLOOD COOLANT PUMP_3.7 kW_2.0 MPA	○
4		THROUGH SPINDLE COOLANT_None	●
5		THROUGH SPINDLE COOLANT_1.5 kW_2.0 MPA	○
6		THROUGH SPINDLE COOLANT_3.7 kW_2.0 MPA	○
7	Travels	LINEAR SCALE (X, Y, Z-AXIS)	●
8		RAISING BLOCK 200 mm	○
9		RAISING BLOCK 300 mm	○
10	Magazine	MAGAZINE CAPACITY: 40 TOOLS	●
11		MAGAZINE CAPACITY: 60 TOOLS	○
12	Control System	FANUC 31I-B	●
13		DSQ1 (AICC II_200 BLOCKS)	●
14		DSQ2 (DSQ1 & DATA SERVER 1GB)	○
15		DSQ3 (DSQ2 & 600 BLOCKS)	○
16		DSQ4 (DSQ3 & 1000 BLOCKS)	○
17		EXTRA M CODE	○
18		FLASH MEMORY CARD	○
19	Others	SEMI SPLASH GUARD	●
20		FULL SPLASH GUARD	○
21		OIL SKIMMER	○
22		COOLANT GUN	●
23		CHIP CONVEYOR	○
24		AIR BLOWER	●
25		AIR GUN	○
26		AIR CONDITIONER	○
27		ELECTRIC CABINET LIGHT	○
28		WORK & TOOL COUNTER	○
29		1 MPG	●
30		3 MPG	○
31		LCD Display MPG	○
32		TRANSFORMER	○
33		3-STAGE SIGNAL TOWER	●
34		WORK LIGHT	●

Optional Devices

Various solutions are available for better machining performance and higher-quality molds.

Tool measuring device

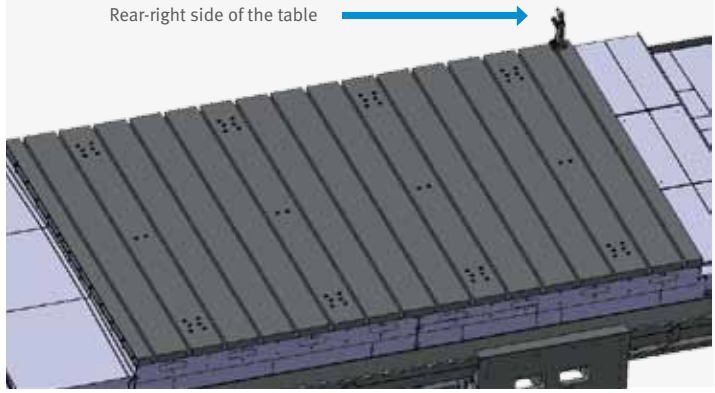
NC4

TS27R

Position of tool measuring device

(Wired & fixed types)

Rear-right side of the table



Convenience

Operator convenience and work efficiency have been improved with the adoption of various convenience controls and ergonomic design.

Coolant Gun

Coolant gun for removing chips included as a standard feature for the operator's convenience

Work Light (LED)

Work light under the cross

MPG

MPG suitable for large works

Portable MPG

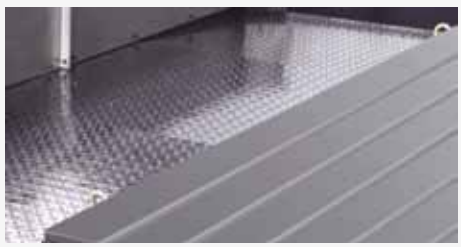
Portable 3 MPG

Full Splash Guard option

Full splash guard for cleaner and safer work environment

Inner Footing (LED)

Footings at the front, right/left sides of the table



Position Display MPG (LCD)

option

Semi-Splash Guard

3-Stage Signal Tower

Warning lamp
Reports abnormal operational conditions of the machine

Work completion indicator
Indicates that the work has been completed

In-progress lamp
Indicates that the work is being carried out

Chip Disposal

Hinged type C/C
BM 1530M BM 2035M

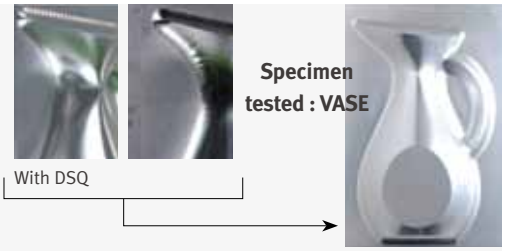
Optimized Tool Processing Solution

Superior surface finishes and machining accuracy are achieved through using standard processing solutions such as high-speed / high-precision contour control and thermal displacement compensation.

High Speed / High Precision Contour Control

* DSQ : Doosan Super Quality

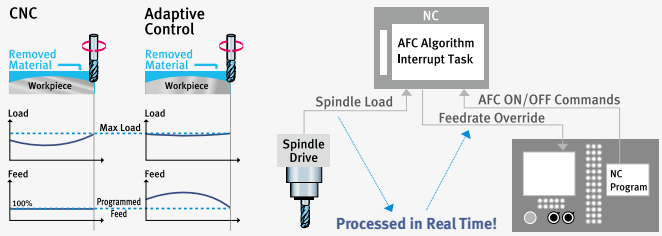
- **DSQ1**
  (AICC2 _ 200 Block + Machining condition selection function)
- **DSQ2** option
  (DSQ1 + Data server [1GB])
- **DSQ3** option
  (DSQ2 + High speed processing _ 600 Block)
- **DSQ4** option
  (DSQ3 + High speed processing_1000 block)



The Optimal Feed Control option

* DAFC : Doosan Adaptive Feedrate Control

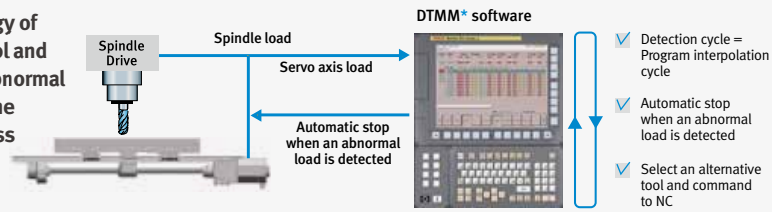
Optimal feed control is ensured by real-time spindle load detection.



Tool Load Monitoring System (DTMM*) option

* DTMM : Doosan Tool load Monitoring for Machining Centers

The technology of protecting tool and machine in abnormal load during the cutting process



Smart thermal displacement multi compensation technology

* DSTC : Doosan Smart Thermal Control

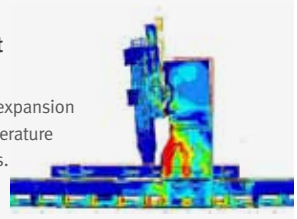
Realizes high-quality, high-precision machining with smoothing thermal displacement compensation of the spindle and structure.

Compensation of static displacement of spindle

Compensates changes in tool position caused by expansion of the spindle shaft at high speed.

Structure thermal displacement compensation

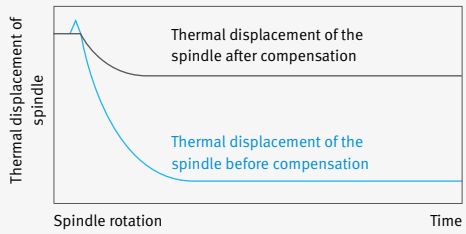
Compensates irregular deflection or expansion of the structure due to ambient temperature using a multiple temperature sensors.



Compensation of structure thermal displacement

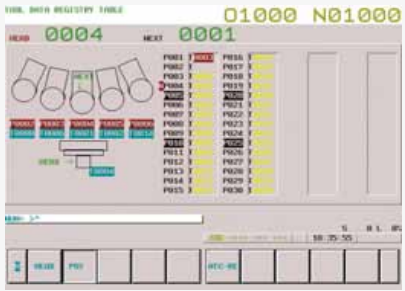
Thermal error of the spindle caused by heat accumulation is compensated with 5 algorithms including a smoothing function.

Without smoothing



Easy Operation Package

These Doosan software packages have been customized to provide fast and easy setup of tooling, workpiece, and program. These functions minimize the idle time caused by process setup and maximize the machine's productivity.



Tool Data Registry Table

Displays the information on the tools in the pot in 2D graphics.

Sensor Status Monitor

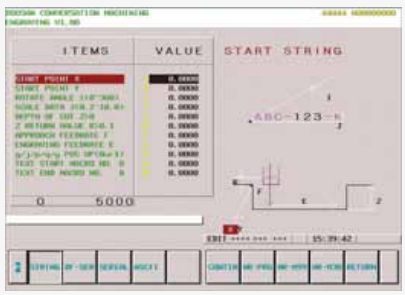
Shows solenoid valve and sensor status without the electric diagram.

Engraving option

Allows character engraving on the workpiece.

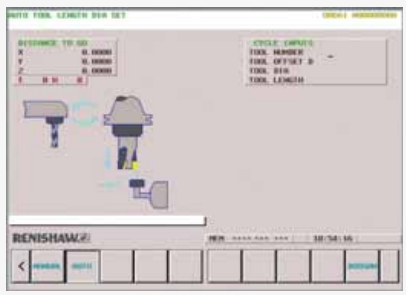
Pattern Cycle

Pattern cycle programs can be created using an interactive way of parameter input.



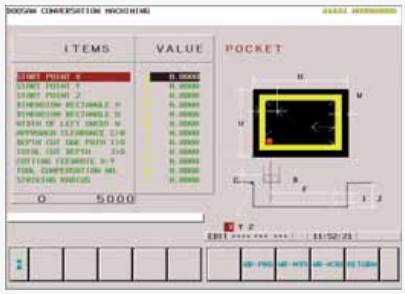
ATC Recovery Help

When ATC is stopped (malfunction or emergency), this function guides the operator to recover the machine back to its normal state.



Tool Load Monitor option

Detects tool damage and wear by setting limits on the load for spindle and axis to minimize mechanical damages.



Renishaw Gui (Tool measure) (Work measure option)

Enables automatic measurement of tool length, tool diameter, and work coordinates, and detects tool damage using an interactive method.

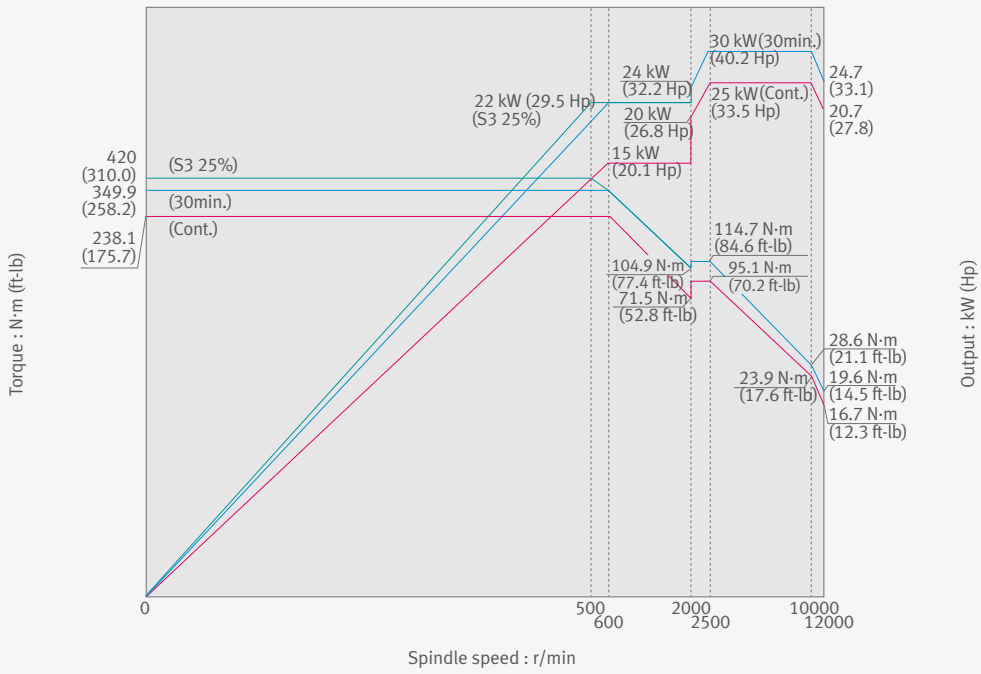
Calculator

Provides all functions of a general calculator plus automatic calculation of cutting size and conditions.

Power-Torque Diagram / Tool Shank

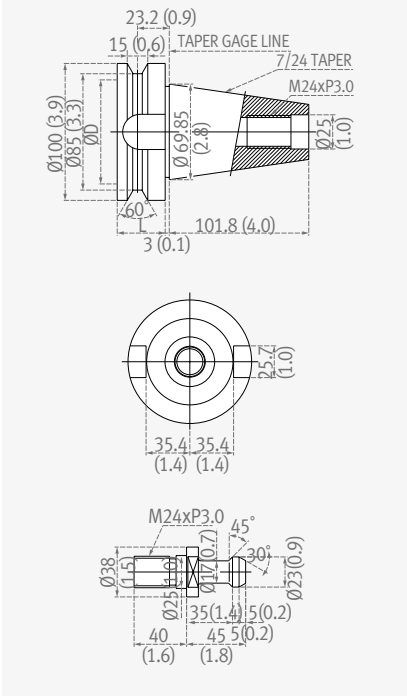
Spindle Power – Torque Diagram

Max. spindle speed : 12000 r/min
Spindle motor : 30 / 25 kw (30 min/Cont.)
(40.2 / 33.5 Hp)

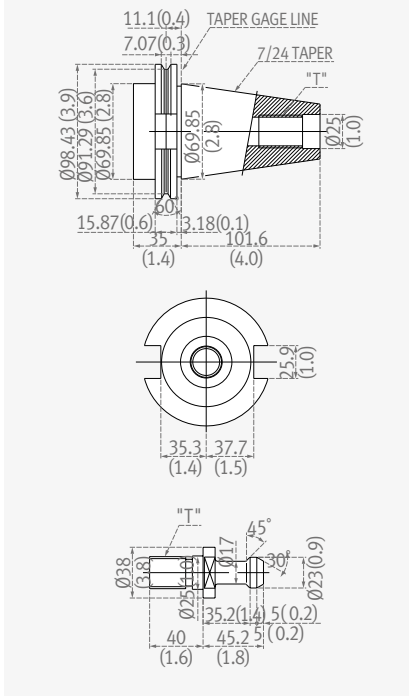


Tool Shank

BT 50

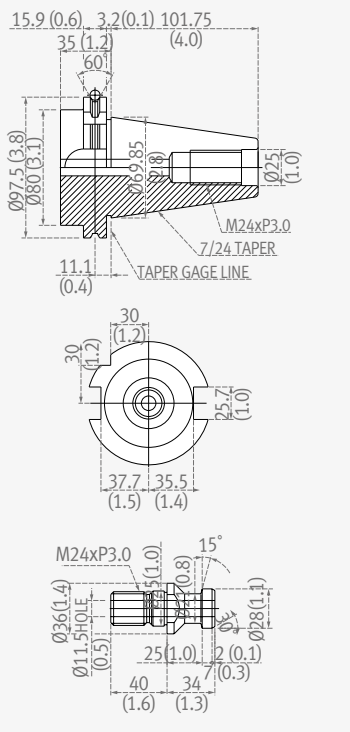


CAT 50



DIN 50

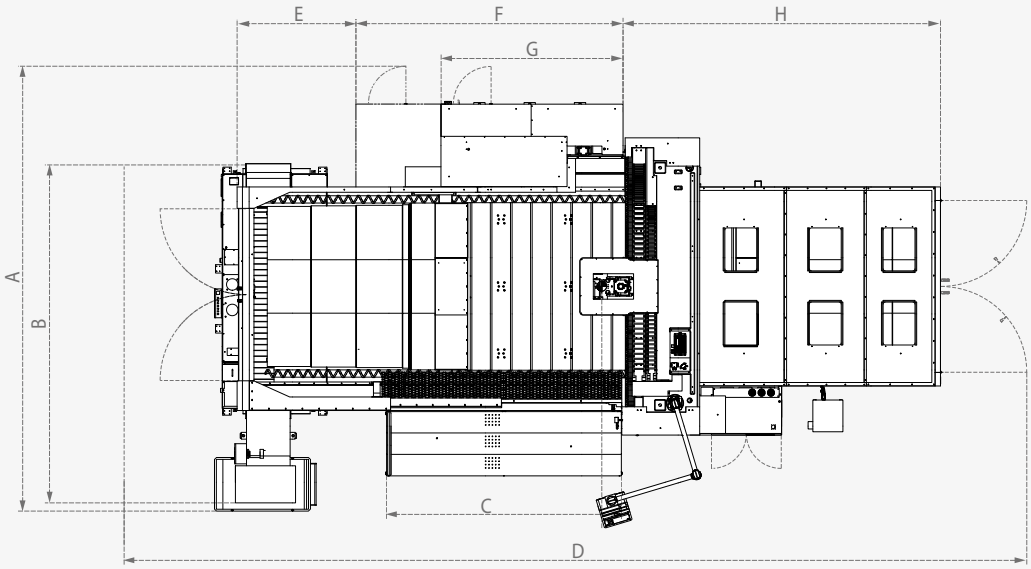
Unit: mm (inch)



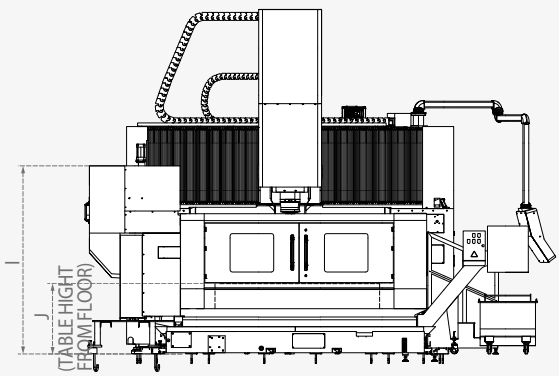
External Dimensions

Unit: mm (inch)

Top View



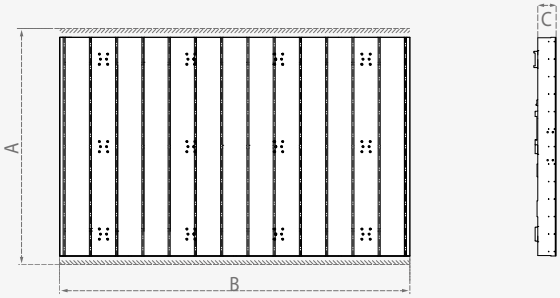
Front View



Model	A	B	C	D	E	F	G	H	I	J
BM 1530M	5543 (218.2)	4282 (168.6)	2768 (109.0)	10944 (430.9)	677 (26.7)	3985 (156.9)	2715 (106.9)	3826 (150.6)	2520 (99.2)	923 (36.3)
BM 2035M	5943 (234.0)	4682 (184.3)	3000 (118.1)	11963 (471.0)	1036 (40.8)	3985 (156.9)	2715 (106.9)	4246 (167.2)	2520 (99.2)	923 (36.3)
BM 2740M	6636 (261.3)	5042 (198.5)	3500 (137.8)	13459 (529.9)	1772 (69.8)	3983 (156.8)	2712 (106.8)	4733 (186.3)	2550 (100.4)	953 (37.5)

Table

Unit: mm (inch)



Model	A	B	C
BM 1530M	1350 (53.1)	3000 (118.1)	210 (8.3)
BM 2035M	1850 (72.8)	3500 (137.8)	210 (8.3)
BM 2740M	2500 (98.4)	4000 (157.5)	210 (8.3)

Machine Specifications

Description		Unit	BM 1530M	BM 2035M	BM2740M
Travel	X-axis	mm (inch)	3000 (118.1)	3500 (137.8)	4000 (157.5)
	Y-axis	mm (inch)	1550 (61.0)	2050 (80.7)	2700 (106.3)
	Z-axis	mm (inch)	800 (31.5)	800 (31.5)	800 (31.5)
Table	Spindle to table surface	mm (inch)	150 - 950 (5.9 - 37.4)		
	Distance between columns	mm (inch)	1700 (66.9)	2200 (86.6)	2700 (106.3)
	Table size	mm (inch)	3000 x 1350 (118.1 x 53.1)	3500 x 1850 (137.8 x 72.8)	4000 x 2500 (157.5 x 98.4)
	Loading capacity	kg (lb)	8000 (17636.7)	10000 (22045.9)	15000 (33068.9)
	Table surface	-	T-SLOT (10-300 x 24H8)	T-SLOT (11-300 x 24H8)	
Spindle	Speed	r/min	12000		
	Taper	-	ISO #50, 7/24		
	Max. torque	N·m (ft-lb)	420 (310.0)		
	Spindle power	kW (Hp)	30 / 25 (40.3 / 33.6) [30min / Cont.]		
Feed rate	Rapid feedrate (X, Y, Z)	m/min (ipm)	16 / 16 / 16 (629.9 / 629.9 / 629.9)		12 / 16 / 16 (472.4 / 629.9 / 629.9)
	Cutting feedrate	mm/min (ipm)	8000 (315.0)		
ATC	Tool shank type	-	BT / CAT / DIN 50		
	Tool storage capacity	ea	40 {60}*		
	Max. tool diameter [w/o adjacent tool]	mm (inch)	125 [220] (4.9 [8.7])		
	Max. tool length	mm (inch)	400 (15.7)		
	Max. tool weight	kg (lb)	18 (39.7)		
	Tool selection type	-	MEMORY RANDOM		
	Tool change time (T-T-T)	s	3.0		
Machine Size	Height	mm (inch)	4770 (187.8)	4770 (187.8)	4675 (184.1)
	Dimension (L x W)	mm (inch)	8690 x 4450 (342.1 x 175.2)	9540 x 4960 (375.6 x 195.3)	10825 x 5535 (426.2 x 217.9)
	Weight	kg (lb)	29000 (63933.1)	35500 (78262.9)	48000 (105820.3)

* { } : Option

NC Unit Specifications

● Standard ○ Optional X N/A

FANUC 31i

Item		Spec.	FANUC 31i
Axes Control	Additional controlled axes	5 axes in total	○
	Least command increment	0.001 mm / 0.0001"	●
	Least input increment	0.001 mm / 0.0001"	●
	Interpolation type pitch error compensation		○
Interpolation & Feed Function	2nd reference point return	G30	●
	3rd / 4th reference return		○
	Inverse time feed		○
	Cylinderical interpolation	G07.1	○
	Helical interpolation B	Only Fanuc 30i	-
	Smooth interpolation		○
	NURBS interpolation		○
	Involute interpolation		○
	Helical involute interpolation		○
	Bell-type acceleration / deceleration before look ahead interpolation		○
	Smooth backlash compensation		●
	Automatic corner override	G62	○
	Manual handle feed rate	x1, x10, x100 (per pulse)	●
	Handle interruption		●
	Manual handle retrace		○
	Nano smoothing	AI contour control II is required.	○
	AICC II	200 BLOCK	●
	AICC II	400 BLOCK	○
	High-speed processing	600 BLOCK	X
	DSQ I	AICC II (200block) + Machining condition selection function	●
	DSQ II	AICC II (200block) + Machining condition selection function + Data server(1GB)	○
	DSQ III	AICC II with high speed processing (600block) + Machining condition selection function + Data server (1GB)	○
	DSQ IV	AICC II with high speed processing (1000block) + Machining condition selection function + Data server (1GB)	○
Spindle & M-code Function	M- code function		●
	Retraction for rigid tapping		●
	Rigid tapping	G84, G74	●
Tool Function	Number of tool offsets	64 ea	●
	Number of tool offsets	99 / 200 / 400 / 499 / 999 / 2000 ea	○
	Tool nose radius compensation	G40, G41, G42	●
	Tool length compensation	G43, G44, G49	●
	Tool life management		●
	Addition of tool pairs for tool life management		○
	Tool offset	G45 - G48	○
Programming & Editing Function	Custom macro		●
	Macro executor		●
	Part program storage	256KB(640m)	●
	Part program storage	512KB (1,280m) / 1MB (2,560m) / 2MB (5,120m) / 4MB (1,0240m), 8MB (2,0480m)	○
	Inch/metric conversion	G20 / G21	●
	Number of Registered programs	500 ea	●
	Number of Registered programs	1000 / 4000 ea	○
	Optional block skip	9 BLOCK	○
	Playback function		○
	Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	48 pairs
	Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	○
OTHERS FUNCTIONS (Operation, setting & Display, etc)	Embeded Ethernet		●
	USB memory interface	Only Data Read & Write	●
	High speed skip function		○
	Polar coordinate command	G15 / G16	○
	Polar coordinate interpolation	G12.1 / G13.1	○
	Programmable mirror image	G50.1 / G51.1	○
	Scaling	G50, G51	○
	Single direction positioning	G60	○
	Pattern data input		○
	Jerk control	AI contour control II is required.	○
	Fast Data server with1GB PCMCIA card		○
	Fast Ethernet		○
	3-dimensional coordinate conversion		○
	3-dimensional tool compensation		○
	Figure copying	G72.1, G72.2	○
	Machining time stamp function		○
	EZ Guide I with 10.4" Color TFT	Doosan infracore Conversational Programming Solution -.When the EZ Guide i is used, the Dynamic graphic display cannot application	○
	Dynamic graphic display (with 10.4" Color TFT LCD)	Machining profile drawing. -.When the EZ Guide i is used, the Dynamic graphic display cannot application	○

Major Specifications

BM series

Description		Unit	BM 1530M	BM 2035M	BM 2740M
Axes Travel Distance	X-axis	mm (inch)	3000 (118.1)	3500 (137.8)	4000 (157.5)
	Y-axis	mm (inch)	1550 (61.0)	2050 (80.7)	2700 (106.3)
	Z-axis	mm (inch)	800 (31.5)		
Table Size (X x Y)		mm (inch)	3000 x 1350 (118.1 x 53.1)	3500 x 1850 (137.8 x 72.8)	4000 x 2500 (157.5 x 98.4)
Distance between columns		mm (inch)	1700 (66.9)	2200 (86.6)	2700 (106.3)
Table Loading Capacity		kg (lb)	8000 (17636.7)	10000 (22045.9)	15000 (33068.9)
Max. Spindle Speed		r/min	12000		
No. of Tool Storage		ea	40 {60}*		

* { } : Option

Doosan Machine Tools

http://www.doosanmachinetools.com
www.facebook.com/doosanmachinetools

Optimal Solutions for the Future

Head Office
Doosan Tower 20th FL., 275, Jangchungdan-Ro (St), Jung-Gu, Seoul
Tel +82-2-3398-8693 / 8671 / 8680
Fax +82-2-3398-8699

Doosan Infracore America Corp.
19A Chapin Rd., Pine Brook, NJ 07058, U.S.A.
Tel +1-973-618-2500
Fax +1-973-618-2501

Doosan Infracore Germany GmbH
Emdener Strasse 24, D-41540 Dormagen, Germany
Tel +49-2133-5067-100
Fax +49-2133-5067-001

Doosan Infracore Yantai Co., LTD
13 Building, 140 Tianlin Road, Xuhui District, Shanghai, China (200233)
Tel +86-21-6440-3384 (808, 805)
Fax +86-21-6440-3389

Doosan Infracore Construction Equipment India Pvt. Ltd. (Machine Tool Div.)
106 / 10-11-12, Amruthahalli, Byatarayanapura, Bellary road, Bangalore-560 092, India
Tel +91-80-4266-0122 / 121 / 100

Doosan International South East Asia Pte Ltd.
42 Benoi Road, Jurong 629903, Singapore
Tel +65-6499-0200
Fax +65-6861-3459

* For more details, please contact Doosan.
* The specifications and information above-mentioned may be changed without prior notice.